AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A method to estimate ~~the~~ an impulse response h of a propagation channel in a system comprising at least one sensor ~~or more sensors~~, the method comprising:

~~at least one step for~~ estimating ~~the~~ statistics of ~~the~~ an additive noise resulting from ~~the~~ an interference and from ~~the~~ a thermal noise on ~~the~~ a basis of ~~the~~ statistics of ~~the~~ a received signal; and

estimating a covariance matrix of a noise from an empirical covariance matrix of observations $\hat{R}_x$ and a number of pilot chips of a learning sequence transmitted with the received signal.

Claim 2 (Currently Amended): A method according to claim 1, ~~comprising a step for estimating the covariance matrix of the noise from the empirical covariance matrix of the observations Rx and the number of pilot chips of a learning sequence transmitted with the signal,~~ wherein the covariance matrix of the noise ~~matrix being~~ is expressed in ~~the~~ a form:

$$\frac{1}{N_0 P}\hat{R}_x$$

in which N_0P is the number of pilot chips.

Claim 3 (Currently Amended): A method according to one of the claims 1 and 2, further comprising:

~~a step for the estimation~~ estimating ~~of the~~ a covariance matrix Γ of the propagation channel. ~~estimated in the form:~~

$$\cancel{\Gamma = \frac{1}{M}\sum_{m=l}^{M}\hat{H}_m\hat{H}_m^H - \frac{1}{N_0P}\hat{R}_x}.$$

Claim 4 (Currently Amended): A method according to claim 3, ~~one of the claims 1 to 3~~ wherein the estimation of the impulse response of the propagation channel uses a Wiener method. ~~and wherein the impulse response of the channel is equal to:~~

$$\cancel{\tilde{H}_m = \left[\frac{1}{M}\sum_{m=l}^{M}\hat{H}_m\hat{H}_m^H - \frac{1}{N_0P}\hat{R}_x\right]\Delta^{-1}\hat{H}_m}$$

Claim 5 (Currently Amended): A method according to claim 1 ~~one of the claims 1 to 4~~, further comprising:

parametrizing a ~~step where the~~ propagation channel space ~~is parametrized~~ by ~~means of~~ an orthonormal base constituted by a given number of vectors $u_1, u_2, \ldots, u_p$.

Claim 6 (Currently Amended): A method according to claim 5, wherein the vectors $u_1, u_2, \ldots, u_p$ correspond to ~~the eigen vectors~~ eigenvectors associated with ~~the greatest~~ highest eigenvalues of the ~~estimated~~ covariance matrix Γ.

Claim 7 (Currently Amended): A method according to claim 5, wherein the vectors $u_1, u_2, \ldots, u_p$ are canonical vectors associated with ~~the~~ positions of ~~the greatest~~ highest values of ~~the~~ a diagonal of the covariance matrix Γ.

Claim 8 (Currently Amended): A method according to claim 5, wherein the vectors $u_1, u_2, \ldots, u_p$ are formed out of sampled versions of ~~the~~ a shaping filter, shifted by ~~the~~ propagation delays of the propagation channel~~, estimated beforehand and standardized~~.

Claim 9 (Currently Amended): A method according to claim 1, wherein ~~one of the claims 1 to 8 to estimate~~ the impulse response of ~~a~~ the propagation channel ~~in the UMTS field for uplinks and/or downlinks~~ is estimated between a base station and at least one ~~or more~~ mobile unit in an UMTS (Universal Mobile Telecommunications System) field for uplinks and/or downlinks ~~units~~.

Claim 10 (Currently Amended): A transmission and/or reception device ~~adapted to estimating the~~ configured to estimate an impulse response of a propagation channel, the device comprising:

at least one sensor ~~one or more sensors~~ for ~~the~~ reception of a signal~~, a~~;

means ~~to sample~~ for sampling the ~~received~~ signal~~, a~~;

means ~~adapted to~~ for estimating ~~the~~ a noise from ~~the~~ statistics of the propagation channel; and

means for estimating a matrix of the noise from an empirical covariance matrix of observations $\hat{R}_x$ and from a number of pilot chips of a learning signal transmitted with the signal.

Claim 11 (Currently Amended): A receiver according to claim 10, wherein ~~comprising a means adapted to estimating the noise from the empirical covariance matrix of the observations $\hat{R}_x$ and from the number of pilot chips of a learning signal transmitted with the signal,~~ the matrix of the noise ~~being~~ is expressed in ~~the~~ a form:

$$\frac{1}{N_0 P}\hat{R}_x$$

in which N_0P is the number of pilot chips.

Claim 12 (Currently Amended): A receiver according to claim 10, device further comprising:

~~a~~ means ~~adapted to~~ for determining the impulse response of the channel in ~~the~~ a form:

$$\tilde{H}_m = \left[\frac{1}{M}\sum_{m=l}^{M}\hat{H}_m\hat{H}_m^H - \frac{1}{N_0P}\hat{R}_x\right]\Delta^{-1}\hat{H}_m$$

in which $\hat{H}_m$ is an estimated value for the propagation channel, Δ is a covariance matrix of the estimated channel, N_0P is a number of pilot chips, $\hat{H}_m^H$ is a conjugate transpose of the estimated value for the propagation channel, M is a number of slots, and $\tilde{H}_m$ is a new estimated value for the propagation channel $\hat{H}_m$.

Claim 13 (Currently Amended): A receiver according to one of the claims 11 and 12 applied in ~~the~~ a field of UMTS (Universal Mobile Telecommunications System).

Claim 14 (New): A method according to claim 3, wherein the covariance matrix is estimated in a form:

$$\Gamma = \frac{1}{M}\sum_{m=l}^{M}\hat{H}_m\hat{H}_m^H - \frac{1}{N_0P}\hat{R}_x$$

in which $\hat{H}_m$ is an estimated value for the propagation channel, N_0P is the number of pilot chips, $\hat{H}_m^H$ is a conjugate transpose of the estimated value for the propagation channel, and M is a number of slots.

Claim 15 (New): A method according to claim 3, wherein the impulse response of the channel is equal to:

$$\tilde{H}_m = \left[\frac{1}{M}\sum_{m=l}^{M}\hat{H}_m\hat{H}_m^H - \frac{1}{N_0P}\hat{R}_x\right]\Delta^{-1}\hat{H}_m$$

in which $\hat{H}_m$ is an estimated value for the propagation channel, Δ is a covariance matrix of the estimated channel, N_0P is the number of pilot chips, $\hat{H}_m^H$ is a conjugate transpose of the estimated value for the propagation channel, M is a number of slots, and $\tilde{H}_m$ is a new estimated value for the propagation channel $\hat{H}_m$.

Claim 16 (New): A method according to claim 8, wherein the propagation delays of the propagation channel are previously estimated and standardized.

Claim 17 (New): A method according to claim 4, further comprising:

parametrizing a propagation channel space by an orthonormal base constituted by a given number of vectors $u_1, u_2, \ldots, u_p$.

Claim 18 (New): A method according to claim 4, wherein the impulse response of the propagation channel is estimated between a base station and at least one mobile unit in an UMTS (Universal Mobile Telecommunications System) field for uplinks and/or downlinks.

Claim 19 (New): A transmission and/or reception device configured to estimate an impulse response of a propagation channel, the device comprising:

a sensor for reception of a signal;

a sampler configured to sample the signal;

a first estimator configured to estimate a noise from a statistics of the propagation channel; and

a second estimator configured to estimate a matrix of the noise from an empirical covariance matrix of observations and from a number of pilot chips of a learning signal transmitted with the signal.

Claim 20 (New): A transmission and/or reception device according to claim 10, the matrix of the noise is expressed in a form:

$$\frac{1}{N_0 P}\hat{R}_x$$

in which N_0P is the number of pilot chips.

Claim 21 (New): A transmission and/or reception device according to claim 19, the matrix of the noise is expressed in a form:

$$\frac{1}{N_0 P}\hat{R}_x$$

in which N_0P is the number of pilot chips.

Claim 22 (New): A transmission and/or reception device according to claim 19, wherein the covariance matrix is estimated in a form:

$$\Gamma = \frac{1}{M}\sum_{m=l}^{M}\hat{H}_m \hat{H}_m^H - \frac{1}{N_0 P}\hat{R}_x$$

in which $\hat{H}_m$ is an estimated value for the propagation channel, N_0P is the number of pilot chips, $\hat{H}_m^H$ is a conjugate transpose of the estimated value for the propagation channel, and M is a number of slots.

Claim 23 (New): A transmission and/or reception device according to claim 19, wherein the impulse response of the channel is equal to:

$$\widetilde{H}_m = \left[\frac{1}{M} \sum_{m=l}^{M} \hat{H}_m \hat{H}_m^H - \frac{1}{N_0 P} \hat{R}_x \right] \Delta^{-1} \hat{H}_m$$

in which $\hat{H}_m$ is an estimated value for the propagation channel, Δ is a covariance matrix of the estimated channel, N_0P is the number of pilot chips, $\hat{H}_m^H$ is a conjugate transpose of the estimated value for the propagation channel, M is a number of slots, and $\widetilde{H}_m$ is a new estimated value for the propagation channel $\hat{H}_m$.

Claim 24 (New): A transmission and/or reception device according to claim 19, further comprising:

parametrizing a propagation channel space by an orthonormal base constituted by a given number of vectors u_1, u_2, ... ,u_p.

Claim 25 (New): A transmission and/or reception device according to claim 24, wherein the propagation delays of the propagation channel are previously estimated and standardized.

Claim 26 (New): A transmission and/or reception device according to claim 24, wherein the impulse response of the propagation channel is estimated between a base station and at least one mobile unit in an UMTS (Universal Mobile Telecommunications System) field for uplinks and/or downlinks.